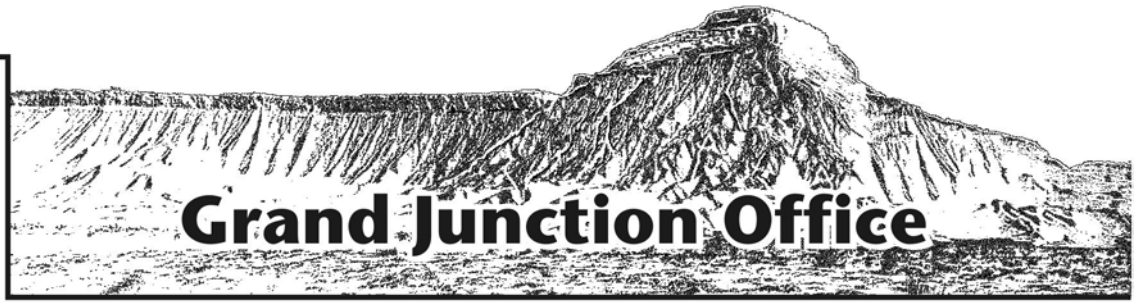
GJO–2003–437–TAC

Hanford Tank Farms Vadose Zone Monitoring Project

Quarterly Summary Report for Second Quarter Fiscal Year 2003

May 2003



U.S. Department of Energy

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May 2003

Prepared for
U.S. Department of Energy
Idaho Operations Office
Grand Junction Office
Grand Junction, Colorado

Prepared by
S.M. Stoller Corp.
Grand Junction Office
Grand Junction, Colorado

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Prepared by:

Paul D. Henwood — 5-6-3

P.D. Henwood — Date
S.M. Stoller, Hanford

Alan Pearson — 5/6/03

A.W. Pearson — Date
S.M. Stoller, Hanford

Concurrence:

R.G. McCain — 5/06/03

R.G. McCain, Hanford Technical Lead — Date
S.M. Stoller, Hanford

Approved by:

W.D. Steele — 5/7/03

W.D. Steele, Project Manager — Date
S.M. Stoller, Grand Junction Office

1.0 Introduction

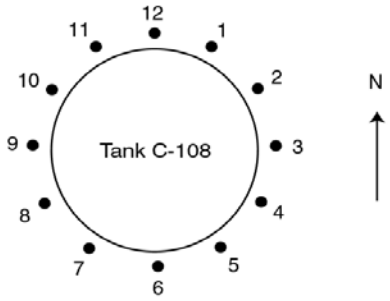
Routine quarterly reports for the Hanford Tank Farms Vadose Zone Monitoring Project are issued to summarize the results of monitoring activities, to provide the status of any on-going special investigations, and to provide an updated listing of borehole intervals where monitoring is planned in the coming months.

For readers not familiar with the Hanford Tank Farms borehole numbering scheme, the following illustration shows how to identify the location of a borehole from its identification number:

Tank Farm Numbering Scheme

A Farm	10
AX Farm	11
B Farm	20
BX Farm	21
BY Farm	22
C Farm	30
S Farm	40
SX Farm	41
T Farm	50
TX Farm	51
TY Farm	52
U Farm	60

Tank Farm Borehole Numbering Scheme



Boreholes are identified by numbers using the format FF-TT-PP, where "FF" = tank farm, "TT" = tank, and "PP" = the position around the tank in a time-clock numeral from 1 to 12 (12 = north). For example, borehole 30-08-02 is in the C Tank Farm, around tank C-108, and at approximately the 2 o'clock position.

2.0 Monitoring Results

A summary of monitoring operations from January 1 to March 31, 2003 is included in Table 2-1.

Table 2-1. Summary of Monitoring Operations for 2nd Quarter of FY 2003

Month	January	February	March	FY Cumulative Total
Total Boreholes	28	34	35	169
Main Log Footage	1987.0	1682.0	2808.0	10,897.5
Rerun Log Footage	80.0	80.0	80.0	420.0
Total Footage	2067.0	1762.0	2888.0	11,317.5

Appendix A provides further details of boreholes monitored during the 2nd quarter of FY 2003, including borehole number, tank number, logging depths and footage, total score (logging priority), projected next monitoring date, dates of High Rate Logging System (HRLS) logging events, dates of RAS monitoring events, and a comment section. This table is derived from the project's monitoring database, which is continually updated (DOE 2003b). Boreholes are selected by a priority score (total score) that emphasizes proximity to tanks with significant

drainable liquid remaining, and/or the presence of contaminant plumes, or where possible contaminant movement is suspected. The most significant change that occurs in the database is the monitoring frequency. Where monitoring results suggest possible contaminant movement, the monitoring frequency and monitoring depth intervals may be changed. Monitoring frequencies may also be changed in response to special requests (e.g. in support of retrieval operations). As discussed in Section 7.0 of the *Annual Monitoring Report for Fiscal Year 2002* (DOE 2003a), some lower priority boreholes were selected for monitoring. This re-prioritization included boreholes in the vicinity of tanks undergoing salt well pumping and those being considered for closure in the near future, such as in C Farm.

A total of 97 boreholes were monitored during the second quarter of FY 2003. The following sections describe the routine monitoring performed in each tank farm. In the interest of brevity, plots for boreholes where no apparent change was observed will not be included in this report. These logs are available on request.

2.1 A Tank Farm

Routine monitoring was not performed in A Farm this quarter.

2.2 AX Tank Farm

Routine monitoring was not performed in AX Farm this quarter.

2.3 B Tank Farm

Routine monitoring was not performed in B Farm this quarter.

2.4 BX Tank Farm

A total of 18 boreholes located around tanks BX-101, -102, -103, -104, -105, -108, and -111 were monitored in BX Farm this quarter. No apparent changes in the radionuclide contaminant distribution were observed.

2.5 BY Tank Farm

Routine monitoring was not performed in BY Farm this quarter.

2.6 C Tank Farm

A total of 22 boreholes located around tanks C-101, -104, -105, -106, -108, -109, and -110 were monitored in C Farm this quarter. Borehole 30-08-03 indicated a possible increase of ^{137}Cs concentrations between 42 and 47 ft in January 2003 when compared to baseline measurements acquired in March 1997 (Appendix B). The monitoring frequency for this borehole has been increased to quarterly. Borehole 30-08-02 indicated potential changes of ^{60}Co concentrations between 50 and 60 ft that confirm changes from the March 1997 baseline that were first

determined by the September 2002 monitoring event (Appendix B). This borehole will continue to be monitored on a quarterly basis. Monitoring data collected from the remaining boreholes showed no evidence of changes in radionuclide contaminant distribution.

2.7 S Tank Farm

A total of eight boreholes located around tanks S-107, -109, and -112 were monitored in S Farm this quarter. Six of the boreholes were monitored to support pending retrieval operations. No apparent changes in the radionuclide contaminant distribution were observed.

2.8 SX Tank Farm

A total of 32 boreholes located around tanks SX-101, -102, -103, -105, -107, -109, -110, -111, -112, -114, and -115 were monitored in SX Farm this quarter. Measurements in borehole 41-10-01 indicated a probable increase in ^{137}Cs concentrations at a log depth of 66 ft (Appendix B). This subtle increase appears to be a continuance of movement first identified in 1999 during repeat logging for the baseline. The frequency of monitoring continues to be biannual. Measurements in borehole 41-15-07 indicate an increase in ^{137}Cs concentrations since the previous RAS measurements acquired on September 2001 (Appendix B). The change occurs between log depths of 57 and 60 ft. Future monitoring in this borehole will be conducted on a biannual basis.

2.9 T Tank Farm

Routine monitoring was not performed in T Farm this quarter.

2.10 TX Tank Farm

A total of six boreholes located around tanks TX-103, -104, -105, and -118 were monitored in TX Farm this quarter. No apparent changes in the radionuclide contaminant distribution were observed.

2.11 TY Tank Farm

Routine monitoring was not performed in TY Farm this quarter.

2.12 U Tank Farm

A total of 10 boreholes located around tanks U-104, -105, -107, -108, and -110 were monitored in U Farm this quarter. Evidence of ^{238}U concentration changes has been identified in the past. Monitoring data collected from boreholes this quarter showed no further evidence of changes in radionuclide contaminant distribution. A draft report currently under review and scheduled to be issued in the 3rd quarter of FY 2003 describes measurements collected over the last 18 months in U Farm to support salt cake dissolution studies.

3.0 Special Investigations

3.1 Tank C-106 Retrieval Monitoring

Monitoring of eight boreholes in the vicinity of tank C-106 will be performed during the 3rd quarter in response to a request from CHG tank waste retrieval operations, in anticipation of planned retrieval operations. RAS data were collected from these boreholes during January 2003 to provide a baseline against which future measurements collected during waste retrieval operations can be compared. These boreholes have been tentatively assigned a monitoring frequency of 3 months. The next RAS monitoring event is scheduled for April 2003.

Moisture logging in seven of these boreholes will also be conducted in April 2003 to provide a pre-retrieval moisture baseline. CHG will use manually operated hand-held neutron moisture gauges to collect measurements from selected depths in these boreholes at frequent intervals during retrieval operations. These measurements will be compared against the moisture baseline. Moisture logging may be conducted again in the future to assess any significant changes detected with the neutron moisture gauges.

3.2 Tank S-102 Retrieval Monitoring

In anticipation of future tank S-102 (S Farm) retrieval activities, all boreholes surrounding this tank have tentatively been assigned a monitoring frequency of 6 months (biannual). This frequency may change when the retrieval project monitoring requirements are finalized. No tank S-102 retrieval monitoring was performed during this quarter. The next RAS routine monitoring event is scheduled for the 4th quarter.

3.3 Tank S-112 Retrieval Monitoring

Monitoring of boreholes in the vicinity of tank S-112 is being performed in response to a verbal request from CHG tank waste retrieval operations, in anticipation of planned retrieval operations. RAS data were collected in six boreholes during June 2002 to provide a baseline against which future measurements collected during waste retrieval operations can be compared. The six boreholes have tentatively been placed on a monitoring frequency of 6 months (biannual) until retrieval project monitoring requirements are defined. These six boreholes were monitored this quarter (Section 2.7). In the event retrieval operations do not commence, the next routine RAS monitoring event is scheduled for September 2003.

3.4 Tank U-107 Retrieval Monitoring

A special investigation of boreholes around tank U-107 (U Farm) has been completed. A draft report summarizing all measurements has been prepared and will be issued during the 3rd quarter. This investigation was initiated in June 2001 at the request of the DOE-ORP Project Manager to support waste retrieval operations. The seventh quarterly monitoring event for selected boreholes was completed during March 2003. A second round of moisture measurements was

completed during February 2003. No significant changes in contaminant profile have been observed in seven monitoring events conducted since June 2001. The moisture profile did not change significantly in the vadose zone at or below the tank between the November and February measurements; some infiltration of moisture in the upper 10 ft of the boreholes was observed (Appendix C). It has been concluded that the retrieval operations had no effect on the vadose zone in the vicinity of the tank. One more quarterly monitoring event is scheduled to be conducted during the 3rd quarter. Subsequently, these boreholes will be returned to routine monitoring on an annual basis.

4.0 Operational Issues

The monitoring rate (boreholes/day) continues to fall short of the project goal of 3 boreholes per day. This rate incorporates all operational aspects of monitoring, including both scheduled and unscheduled down time for maintenance, operator support, security, etc. The monitoring rate achieved during the 2nd quarter of FY 2003 improved to 1.8 boreholes per day compared to the rate of 1.3 boreholes per day achieved last quarter.

The increase in monitoring rate this quarter is due to a decrease in the total amount of down time. The decrease in down time is primarily due to fewer truck/equipment problems this quarter. There continues to be a significant amount of time lost due to the lack of operator support, usually because the operators are assigned other tasks by CHG management. The down time related to lack of operator support has remained relatively constant during the past three quarters (between 107 and 126 hours per quarter, or approximately 25 percent of the total available logging time).

Tables 4-1 and 4-2 include summaries of production and operational issues, respectively, that affect monitoring production.

Table 4-1. Summary of Monitoring Production

Quarter	Total Work Days	Total Days Down	Total Boreholes Monitored	Boreholes Monitored per Day
3rd of FY02	59	21.1	113	1.9
4th of FY02	66	27.6	144	2.2
1st of FY03	56	34.7	72	1.3
2nd of FY03	55	22.5	97	1.8
Cumulative Total	236	105.9	426	N/A
Average/Quarter	59.0	26.5	106.5	1.8

Table 4-2. Summary of Operational Down Time

Quarter	Equipment/ Truck Problems (hrs)	No HPT/ Operator Support (hrs)	System Calibration (hrs)	No Charge Code or Administrative (hrs)	Moving Truck (hrs)	Weather (hrs)	Misc. (hrs)	Total Down Time (hrs)
3rd of FY02	30.5	62	0	36	27	8	26	189.5
4th of FY02	81	122	0	0	37	0	8	248
1st of FY03	71	107	0	18	18	0	98	312
2nd of FY03	27	126	35	0	10	0	0	198
Cumulative Total	209.5	417	35	54	92	8	132	947.5
Average/Quarter	52.4	104.3	8.8	13.5	23.0	2.0	33.0	236.9

5.0 Future Monitoring Operations

Appendix D provides a summary by tank farm of prioritized boreholes available for monitoring through the end of the 3rd quarter of FY 2003. This list includes all boreholes with a total score in excess of 23 and a next monitoring date that is overdue or will become overdue within 90 days and likely contains more boreholes than can actually be monitored during the quarter.

The monitoring will continue to cycle through the farms, collecting additional data from boreholes of interest, those selected for special study, and a number of boreholes that have lower priority but have not been logged for several years. Tank farms A, AX, B, BX, BY, C, S, SX, T, TX, TY, and U may be visited during the 3rd quarter of FY 2003.

References

U.S. Department of Energy (DOE), 2003a. *Hanford Tank Farms Vadose Zone Monitoring Project, Annual Monitoring Report for Fiscal Year 2002*, GJO-2003-400-TAC, Grand Junction Office, Grand Junction, Colorado.

U.S. Department of Energy (DOE), 2003b. *Hanford Tank Farms Vadose Zone Monitoring Project, Baseline Monitoring Plan*, GJO-HGLP 1.8.1, Revision 0, Grand Junction Office, Grand Junction, Colorado.

Appendix A
Boreholes Monitored During Second Quarter FY 2003

Appendix A. Boreholes Monitored During Second Quarter FY 2003

Borehole Number	Tank	Top	Bottom	Footage	Rerun Footage	Total Score	Next Log Date	HRLS	RAS Event A	RAS Event B	RAS Event C	RAS Event D	RAS Event E	RAS Event F	Ras Event G	Comment
21-01-01	BX-101	15	99	89	10	33	03/25/04		03/25/02	03/31/03						No apparent change
21-04-11	BX-104	35	97	62	10	27	03/21/04		03/18/02	03/27/03						No apparent change
21-05-06	BX-105	35	99	64		28	03/21/04		03/19/02	03/27/03						No apparent change
21-08-07	BX-108	30	99	69	10	28	03/21/04		03/19/02	03/27/03						No apparent change
21-00-05	BX-101	35	130	95		33	03/20/04		03/14/02	03/26/03						No apparent change
21-27-08	BX-102	35	148	113	10	106	09/22/03		08/14/01	03/13/02	09/04/02	03/26/03				Apparent change 137.5-148.5 ft not confirmed
21-03-03	BX-103	35	90	55		55	09/17/03		08/28/01	02/25/02	09/04/02	03/21/03				No apparent change
21-05-05	BX-105	35	99	64		28	03/15/04		03/18/02	03/21/03						No apparent change
21-27-11	BX-102	30	136	106		106	09/17/03		08/20/01	03/14/02	09/04/02	03/21/03				No apparent change
21-01-02	BX-101	35	98	63		33	03/14/04		03/13/02	03/20/03						No apparent change
21-02-03	BX-102	35	99	64		106	09/16/03		08/14/01	03/13/02	09/04/02	03/20/03				No apparent change
21-03-05	BX-103	35	80	45		30	03/14/04		02/25/02	03/20/03						No apparent change
21-27-01	BX-102	35	98	63		106	09/16/03		08/28/01	03/13/02	09/04/02	03/20/03				No apparent change
21-00-09	BX-111	35	73	38		32	03/07/04		03/19/02	03/13/03						No apparent change
21-00-21	BX-111	35	100	65		32	03/07/04		03/20/02	03/13/03						No apparent change
21-00-22	BX-111	20	72	52		32	03/07/04		03/20/02	03/13/03						No apparent change
21-11-05	BX-111	35	75	40		32	03/07/04		03/20/02	03/13/03						No apparent change
21-11-07	BX-111	35	75	40		32	03/07/04		03/20/02	03/13/03						No apparent change
40-07-04	S-107	40	80	40	10	23	03/06/04		03/12/03							No apparent change
40-07-11	S-107	35	80	45		23	02/14/08		03/12/03							No apparent change
40-12-02	S-112	0	99	99		12	09/08/03		06/05/02	03/12/03						No apparent change; special request
40-09-06	S-109	0	98	98		2	09/07/03		06/05/02	03/11/03						No apparent change; special request
40-12-07	S-112	0	98	98		12	09/07/03		06/04/02	03/11/03						No apparent change; special request
40-12-09	S-112	0	99	99		12	09/07/03		06/05/02	03/11/03						No apparent change; special request
40-07-06	S-107	40	80	40		23	02/12/08		03/10/03							No apparent change
40-12-04	S-112	0	126	126		12	09/06/03		06/04/02	03/10/03						No apparent change; special request
40-12-06	S-112	0	144	144	10	12	09/06/03		06/04/02	03/10/03						No apparent change; special request
60-07-10	U-107	0	98	98	10	85	06/04/03		07/09/01	10/24/01	12/27/01	04/15/02	08/26/02	11/05/02	03/06/03	Apparent change (SGLS); 53-65 ft not confirmed
60-08-04	U-108	0	127	127		56	06/04/03		07/09/01	10/25/01	12/28/01	04/15/02	08/27/02	11/05/02	03/06/03	No apparent change
60-07-01	U-107	0	98	98		85	06/03/03		07/12/01	10/04/01	12/26/01	04/10/02	08/23/02	11/05/02	03/05/03	Apparent change 83-88 ft not confirmed
60-07-02	U-107	0	125	125		53	06/03/03		07/12/01	10/04/01	12/26/01	04/15/02	08/23/02	11/04/02	03/05/03	Apparent decrease 90-100 ft not confirmed
60-07-11	U-107	0	124	124		85	06/03/03		07/12/01	10/24/01	12/27/01	04/15/02	08/26/02	11/05/02	03/05/03	Apparent change (SGLS); 73-95 ft not confirmed
60-05-04	U-105	35	72	37		44	06/01/03		07/16/01	10/24/01	08/27/02	11/14/02	03/03/03			No apparent change
60-10-01	U-110	0	125	125		10	06/01/03		07/17/01	10/04/01	12/27/01	04/11/02	08/26/02	11/06/02	03/03/03	No apparent change
60-10-11	U-110	0	98	98	10	10	06/01/03		07/17/01	10/04/01	01/02/02	04/11/02	08/26/02	11/06/02	03/03/03	No apparent change
60-04-08	U-104	40	118	78		94	05/27/03		07/16/01	10/22/01	01/03/02	04/10/02	08/27/02	11/14/02	02/26/03	Apparent change (74-78 and 84-89 ft) not confirmed
60-05-05	U-105	35	123	88		44	05/27/03		07/16/01	08/27/02	11/13/02	02/26/03				Possible increase 75-80 ft
41-07-07	SX-107	40	74	25		56	08/23/03	04/19/02	09/26/01	04/09/02	02/24/03					No apparent change; HRLS 04/19/02
41-11-10	SX-111	40	95	69		54	08/23/03	04/18/02	09/25/01	04/09/02	02/24/03					No apparent change; HRLS 04/18/02
41-09-07	SX-109	40	73	35		58	08/12/03	04/22/02	10/03/01	04/05/02	02/13/03					No apparent change; HRLS 04/22/02
41-09-09	SX-109	40	95	66		58	08/12/03		10/03/01	04/05/02	02/13/03					No apparent change
41-12-03	SX-112	40	75	40		63	02/08/04		10/03/01	02/13/03						No apparent change
41-11-08	SX-111	40	85	45		23	01/17/08		02/12/03							No apparent change
41-15-07	SX-115	40	90	50	10	65	02/07/04		09/25/01	02/12/03						Apparent Cs-137 increase (57-60 ft)
41-10-01	SX-110	40	80	40		54	08/10/03		09/13/01	04/01/02	02/11/03					Possible ongoing Cs-137 increase at 66 ft

41-10-02	SX-110	40	80	40	10	23	01/16/08		02/11/03							No apparent change
41-14-06	SX-114	30	76	46		40	02/06/04		04/02/02	02/11/03						No apparent change
41-14-09	SX-114	40	75	35		40	02/06/04		04/02/02	02/11/03						No apparent change
41-14-11	SX-114	40	75	35	10	40	02/06/04		04/02/02	02/11/03						No apparent change
41-00-08	SX-109	40	90	50	10	58	08/09/03		08/20/01	03/28/02	09/06/02	02/10/03				No apparent change
41-07-10	SX-107	40	72	32	10	25	01/15/08		02/10/03							No apparent change
41-09-02	SX-109	40	74	34		33	02/05/04		03/27/02	02/10/03						No apparent change
41-05-02	SX-105	40	80	40		6	01/12/08		02/07/03							No apparent change
41-05-07	SX-105	45	123	78	10	6	01/12/08		02/07/03							No apparent change
41-05-10	SX-105	40	95	55		6	01/12/08		02/07/03							No apparent change
41-05-12	SX-105	35	80	45		6	01/12/08		02/07/03							No apparent change
41-03-05	SX-103	40	80	40		45	02/01/04		03/26/02	02/06/03						No apparent change
41-03-06	SX-103	40	80	40		20	01/11/08		02/06/03							No apparent change, Salt Well Pumping
41-05-05	SX-105	45	132	87		6	01/11/08		02/06/03							No apparent change, Salt Well Pumping
41-03-02	SX-103	30	80	50		45	01/31/04		03/26/02	02/05/03						No apparent change
41-03-09	SX-103	40	80	40		20	01/10/08		02/05/03							No apparent change
41-03-10	SX-103	40	80	40	10	20	01/10/08		02/05/03							No apparent change
41-03-12	SX-103	40	80	40		20	01/10/08		02/05/03							No apparent change
41-01-04	SX-101	40	80	40		14	01/30/04		02/04/03							No apparent change
41-01-11	SX-101	40	80	40		14	01/30/04		02/04/03							No apparent change
41-02-02	SX-102	25	139	114		82	08/03/03		09/07/01	03/26/02	09/06/02	02/04/03				Possible change not confirmed; possible Sr-90
41-01-01	SX-101	35	80	45		14	01/29/04		02/03/03							No apparent change
41-01-07	SX-101	40	80	40		14	01/29/04		02/03/03							No apparent change
41-01-08	SX-101	40	80	40	10	14	01/29/04		02/03/03							No apparent change
30-05-02	C-105	5	127	122		28	01/24/04		04/22/02	01/29/03						No apparent change, C-106 Retrieval
30-09-06	C-109	30	98	68		40	04/29/03		04/23/02	01/29/03						No apparent change
30-10-01	C-110	30	70	40		19	01/03/08		01/29/03							No apparent change
30-00-09	C-110	30	57	27		19	01/02/08		01/28/03							No apparent change
30-04-02	C-104	30	134	104		34	01/23/04		01/28/03							No apparent change
30-10-02	C-110	30	70	40		19	01/02/08		01/28/03							No apparent change
30-10-09	C-110	30	70	40	10	19	01/02/08		01/28/03							No apparent change
30-06-02	C-106	0	122	122	10	9	01/22/04		01/27/03							No apparent change, C-106 Retrieval
30-06-04	C-106	0	129	129		34	01/22/04		09/11/02	01/27/03						No apparent change, C-106 Retrieval
30-06-12	C-106	0	99	99		47	04/24/03		04/24/02	01/24/03						No apparent change, C-106 Retrieval
30-10-11	C-110	30	70	40		19	12/29/07		01/24/03							No apparent change
30-06-03	C-106	0	98	98		9	01/18/04		01/23/03							No apparent change, C-106 Retrieval
30-06-10	C-106	0	129	129		59	04/23/03		04/23/02	01/23/03						Possible change 124-126 ft Co-60, C-106 Retrieval
30-06-09	C-106	5	98	93	10	47	01/17/04		04/22/02	01/22/03						No apparent change, C-106 Retrieval
30-08-12	C-108	30	98	68		2	01/17/04		01/22/03							No apparent change
30-01-12	C-101	30	70	40		18	12/26/07		01/21/03							No apparent change
30-08-02	C-108	30	99	69	10	27	04/21/03		09/11/02	09/12/02	01/21/03					Definite change in Co-60 49-75 ft
30-08-03	C-108	30	50	20		2	04/21/03		01/21/03							Possible increase 42-47 ft (Cs-137)
30-00-06	C-101	30	110	80	10	18	12/25/07		01/20/03							No apparent change
30-00-01	C-106	0	67	67		34	01/11/04		04/24/02	01/16/03						No apparent change, C-106 Retrieval
30-09-07	C-109	30	124	94	10	27	04/16/03		09/11/02	01/16/03						No apparent change
30-04-03	C-104	20	49	32		34	01/10/04		01/15/03							No apparent change
51-03-11	TX-103	40	99	59	10	30	07/14/03		05/20/02	01/15/03						Poss. change 61-62 and 90-95 ft; No add. changes
51-03-09	TX-103	40	97	57		55	07/13/03		05/13/02	01/14/03						No apparent change
51-04-05	TX-104	40	97	57		54	07/13/03		05/16/02	01/14/03						No apparent change
51-05-07	TX-105	40	106	66		64	07/13/03		05/17/02	01/14/03						No apparent change
51-05-05	TX-105	40	98	58		64	07/12/03		05/17/02	01/13/03						No apparent change
51-18-03	TX-118	10	79	69	10	30	01/08/04		01/13/03							No apparent change

Appendix B
Comparison of the Current RAS and the SGLS Baseline Measurements

Stoller
Grand Junction Office established 1959

Hanford Single Shell Tank Farms
Borehole Geophysics Summary Sheet

Borehole Number (Alias): 30-08-03 (299-E27-51) (A6676)

Borehole Information

Site: C Farm, Tank C-108			
Coordinates (HAN Plant):	**North: 42932**	**West: 48345**	**Elevation (ft): 646.96**
Coordinates (WA Plane):	**North: 136568.869**	**East: 575155.576**	**Elevation (m): 197.954**
Drill Date: 12/31/1944	**Type: Cable Tool**	**Depth (ft): 50**	**Depth Datum: TOC**
Depth/Water (D/W) (ft): Dry	**D/W Date: 1/21/03**	**D/W Reference: Stoller**	
Comments: This borehole was drilled to a depth of 150 ft. The 8" casing was perforated from 48 to 148 ft. Total current depth is only 50 ft.			

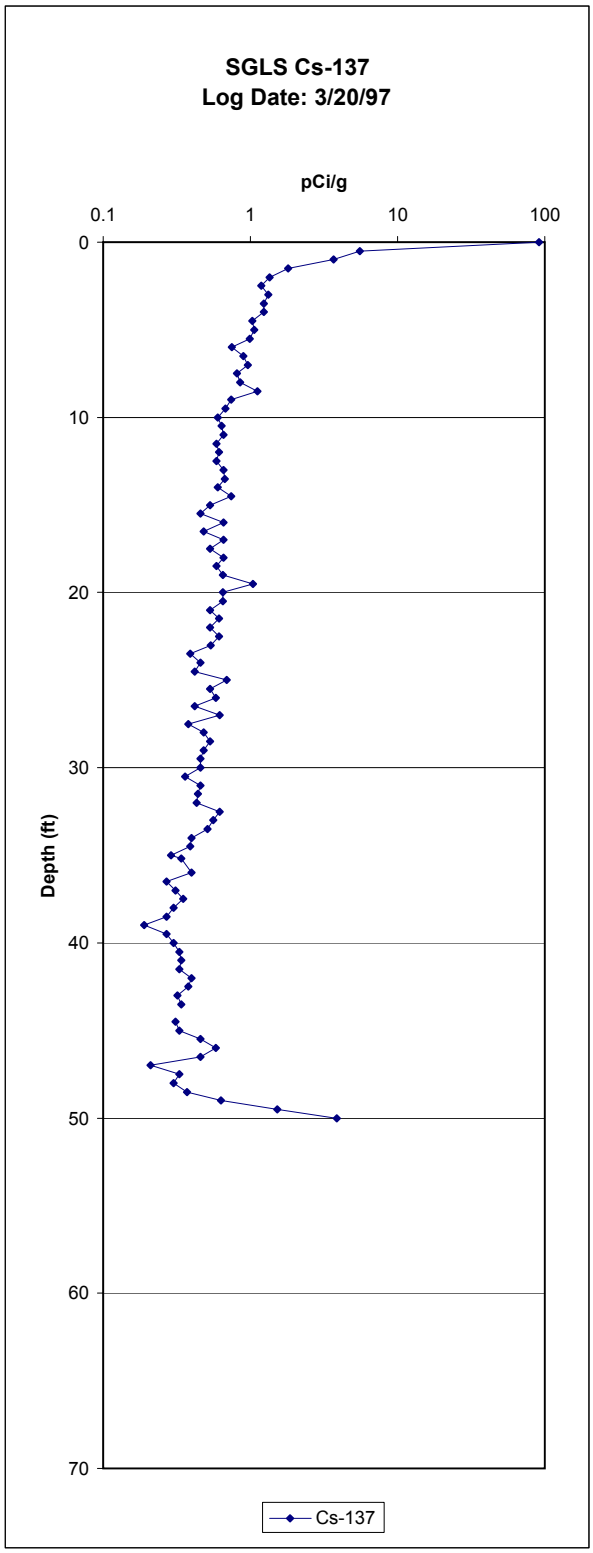
Casing Information

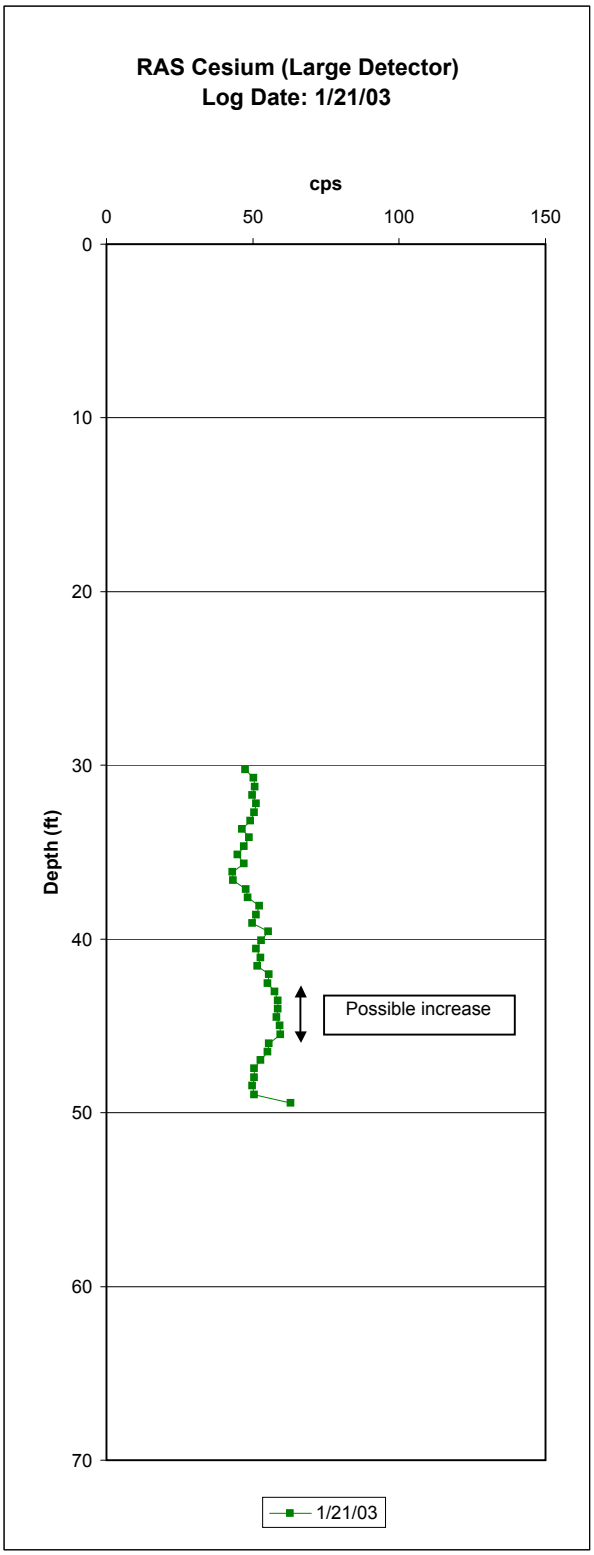
Type	Top (ft)	Bottom (ft)	ID (in.)	Thick (in.)	Stickup (ft)	Reference
Steel	0	150	8	0.322	0	Stoller
Steel	0	50	12	0.406	0	Stoller

Log Run Information

Log Date	System	Detector	Event	Log int. (ft)	Contractor	Comments
5/27/1963	Nat. Gamma	Unk	n/a	0-78	PNL	Copy at Sigma 5
11/5/1964	Nat. Gamma	Unk	n/a	0-78	PNL	Copy at Sigma 5
3/20/1997	SGLS	G1B	n/a	0-50	MACTEC-ERS	Baseline
1/21/2003	RAS	Large-New	A	30-50	Stoller	Possible increase 42-47 ft

Borehole 30-08-03





Stoller
Grand Junction Office established 1959

Hanford Single Shell Tank Farms
Borehole Geophysics Summary Sheet

Borehole Number (Alias): 30-08-02 (299-E27-94) (A6719)

Borehole Information

Site: C Farm, Tank C-108			
Coordinates (HAN Plant):	**North: 42965**	**West: 48363**	**Elevation (ft): 647.00**
Coordinates (WA Plane):	**North: 136578.828**	**East: 575150.01**	**Elevation (m): 197.951**
Drill Date: 9/30/1974	**Type: Cable Tool**	**Depth (ft): 99**	**Depth Datum: TOC**
Depth/Water (D/W) (ft): Dry	**D/W Date: 1/21/03**	**D/W Reference: Stoller**	
Comments: None.			

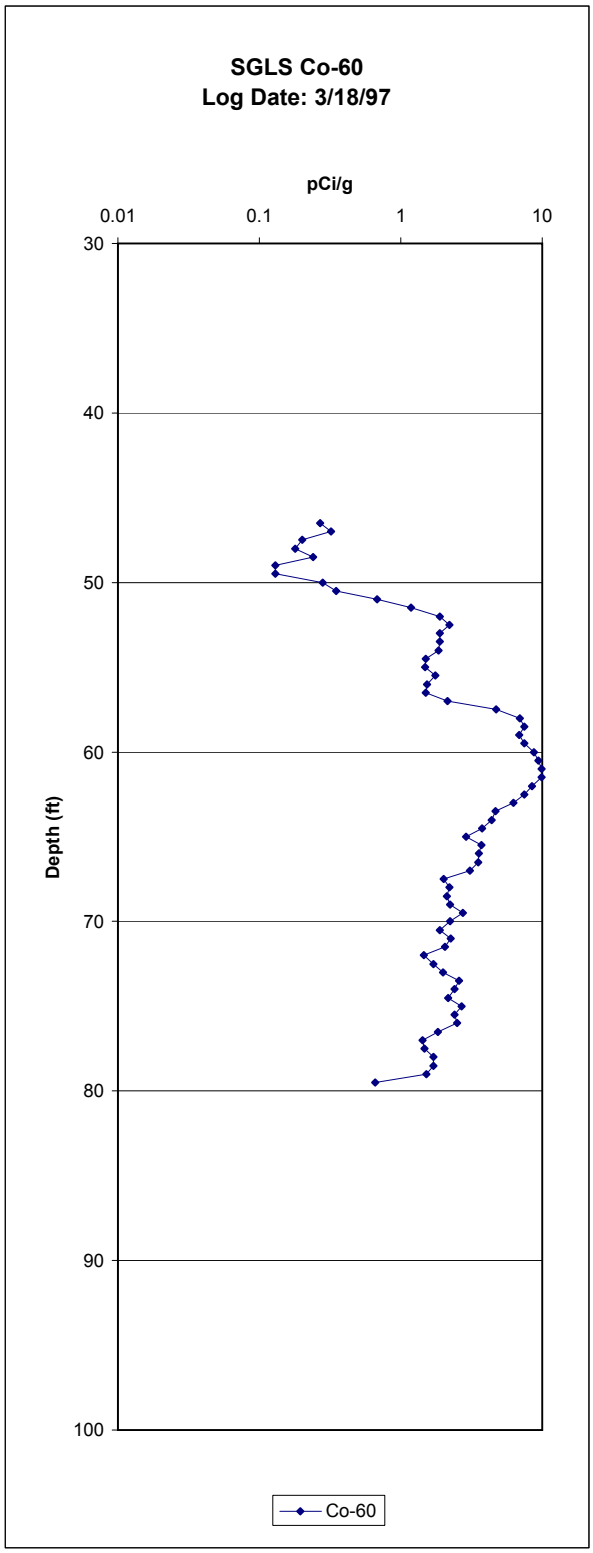
Casing Information

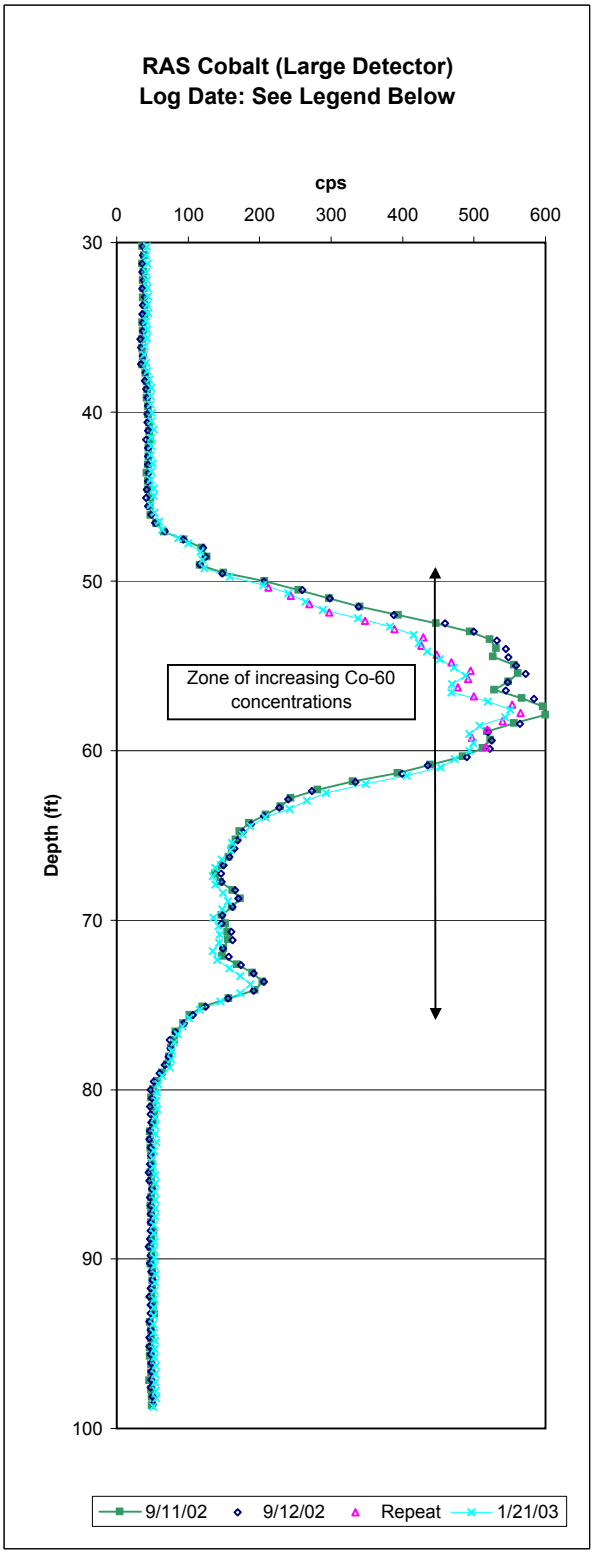
Type	Top (ft)	Bottom (ft)	ID (in.)	Thick (in.)	Stickup (ft)	Reference
Steel	0	100	6	0.28	0	Stoller

Log Run Information

Log Date	System	Detector	Event	Log int. (ft)	Contractor	Comments
3/18/1997	SGLS	G1B	n/a	0-99	MACTEC-ERS	Baseline
9/11/2002	RAS	Large	A	30-99	Stoller	Co-60 increase 49-75 ft
9/12/2002	RAS	Large	B	30-99	Stoller	No change from above.
1/21/2003	RAS	Large-New	C	30-99	Stoller	Downward movement.

Borehole 30-08-02





Stoller
Grand Junction Office established 1959

Hanford Single Shell Tank Farms
Borehole Geophysics Summary Sheet

Borehole Number (Alias): 41-10-01 (299-W23-80) (A7916)

Borehole Information

Site: SX Farm, Tank SX-110			
Coordinates (HAN Plant):	**North: 35290**	**West: 75645**	**Elevation (ft): 663.31**
Coordinates (WA Plane):	**North: 134217.453**	**East: 566841.599**	**Elevation (m): 203.22**
Drill Date: 2/22/1962	**Type: Cable Tool**	**Depth (ft): 134**	**Depth Datum: TOC**
Depth/Water (D/W) (ft): Dry	**D/W Date: 2/3/03**	**D/W Reference: Stoller**	
Comments: This borehole was deepened from 75 to 135 ft in 1973.			

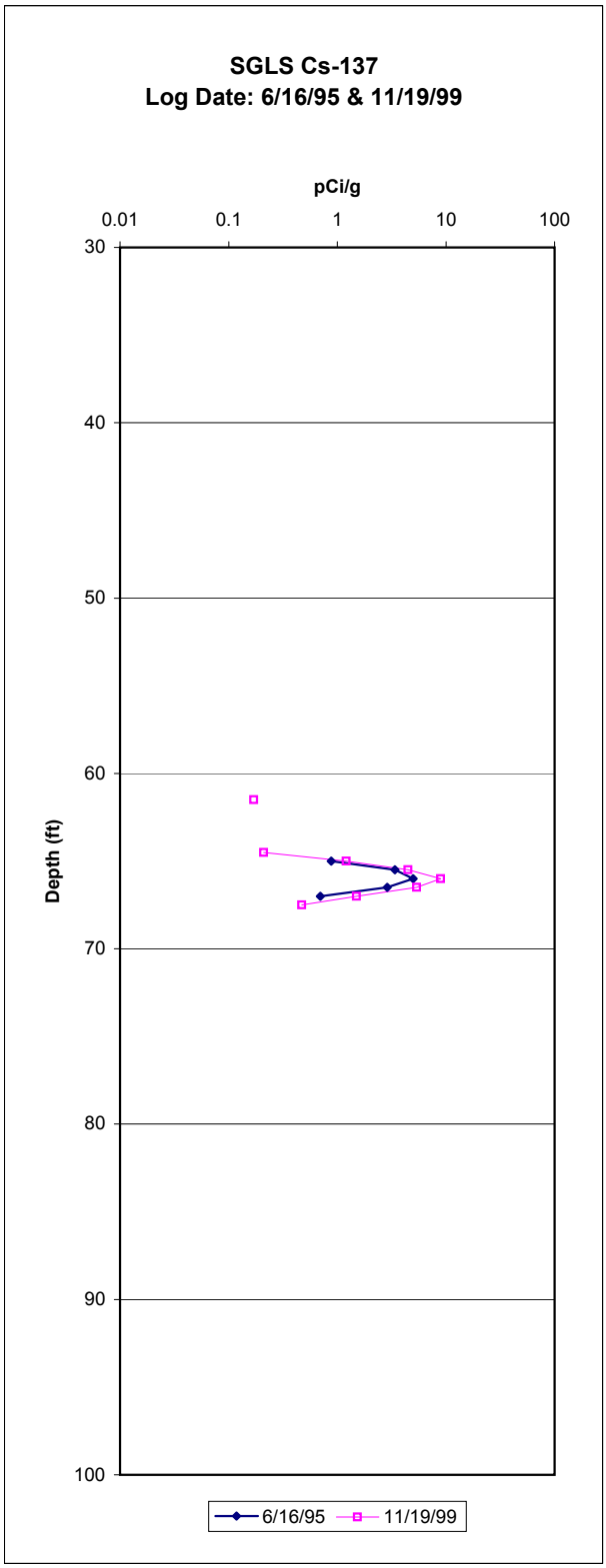
Casing Information

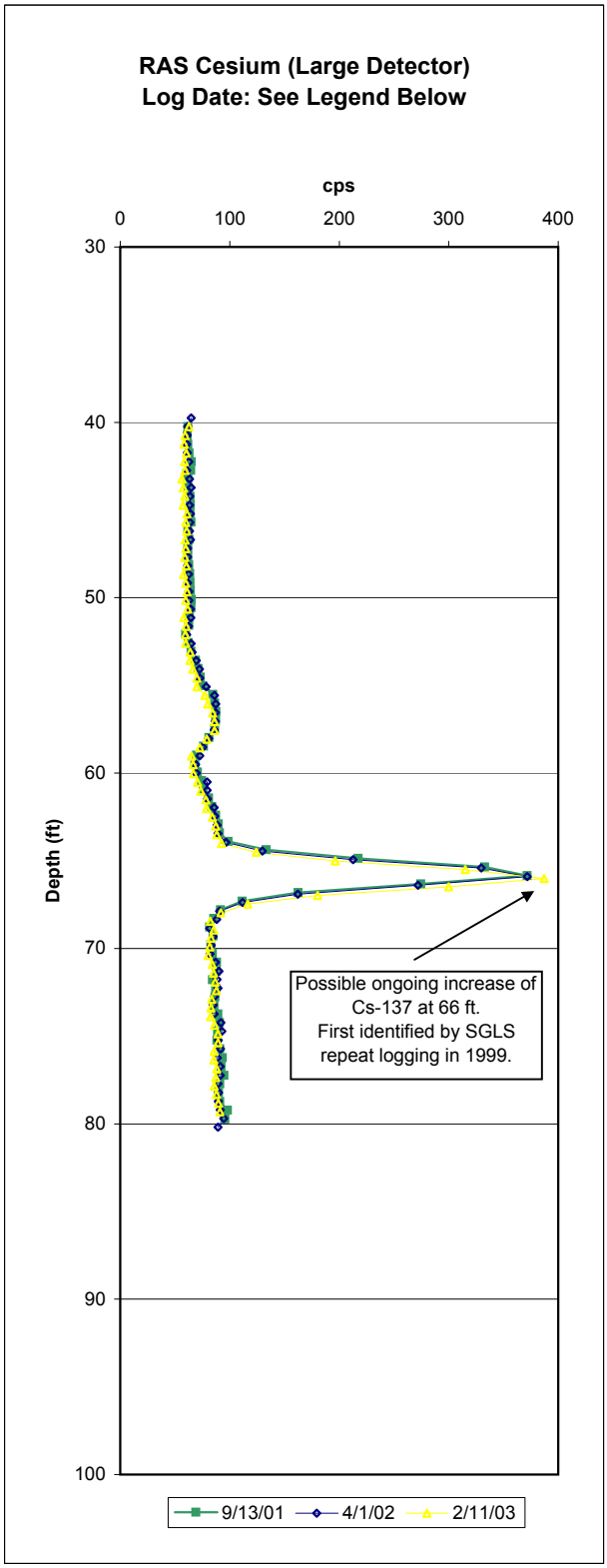
Type	Top (ft)	Bottom (ft)	ID (in.)	Thick (in.)	Stickup (ft)	Reference
Steel	0	135	6	0.28	0	Stoller

Log Run Information

Log Date	System	Detector	Event	Log int. (ft)	Contractor	Comments
12/13/1962	Nat. Gamma	Unk	n/a	0-74	PNL	On File at Sigma 5
3/14/1964	Nat. Gamma	Unk	n/a	0-74	PNL	On File at Sigma 5
11/2/1964	Nat. Gamma	Unk	n/a	0-74	PNL	On File at Sigma 5
6/16/1995	SGLS	G1A	n/a	0-134	RUST	Baseline
11/19/1999	SGLS	G2B	n/a	60-70	MACTEC-ERS	Cs-137 increase @ 66 ft
9/13/2001	RAS	Large	A	40-80	MACTEC-ERS	Cs-137 increase?
4/1/2002	RAS	Large	B	40-80	MACTEC-ERS	Cs-137 increase?
2/11/2003	RAS	Large-New	C	40-80	Stoller	Cs-137 increase ongoing?

Borehole 41-10-01





Stoller
Grand Junction Office established 1959

Hanford Single Shell Tank Farms
Borehole Geophysics Summary Sheet

Borehole Number (Alias): 41-15-07 (299-W23-70) (A7906)

Borehole Information

Site: SX Farm, Tank SX-115			
Coordinates (HAN Plant):	**North: 35099**	**West: 75894**	**Elevation (ft): 662.99**
Coordinates (WA Plane):	**North: 134159.816**	**East: 566765.965**	**Elevation (m): 202.443**
Drill Date: 3/27/1956	**Type: Cable Tool**	**Depth (ft): 112**	**Depth Datum: TOC**
Depth/Water (D/W) (ft): Dry	**D/W Date: 2/12/03**	**D/W Reference: Stoller**	
Comments: None.			

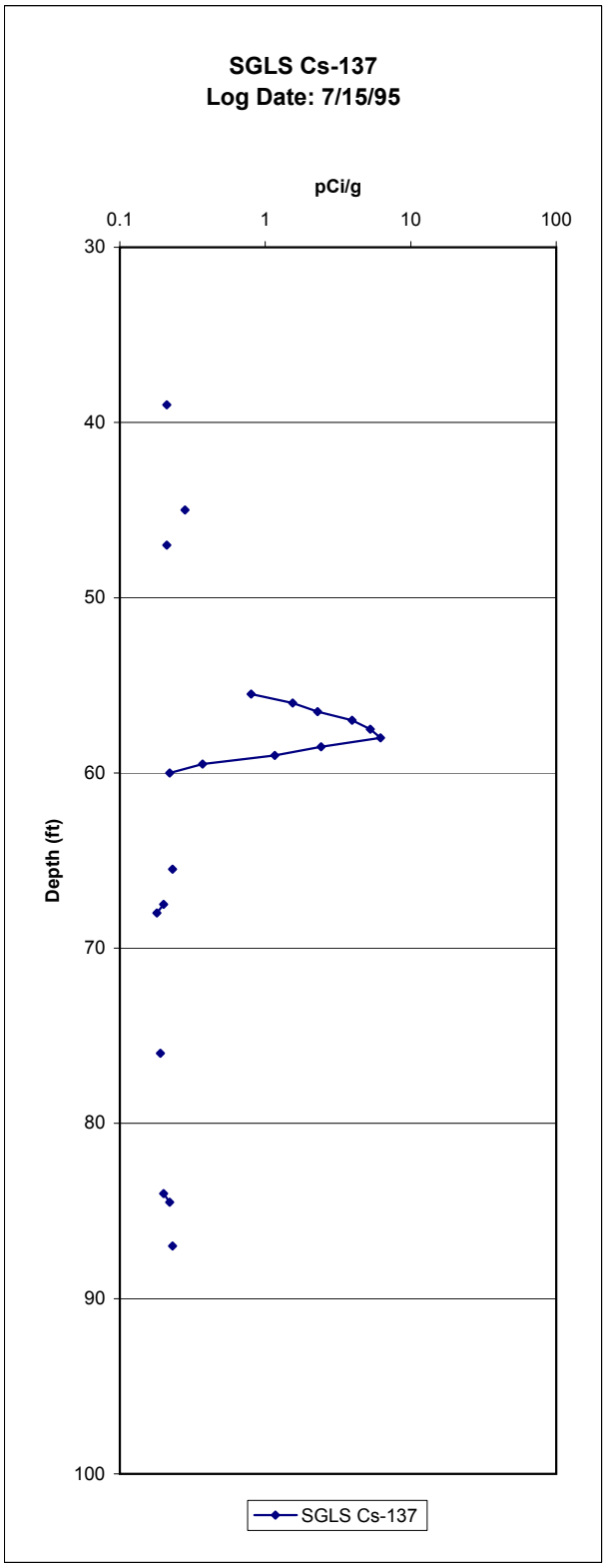
Casing Information

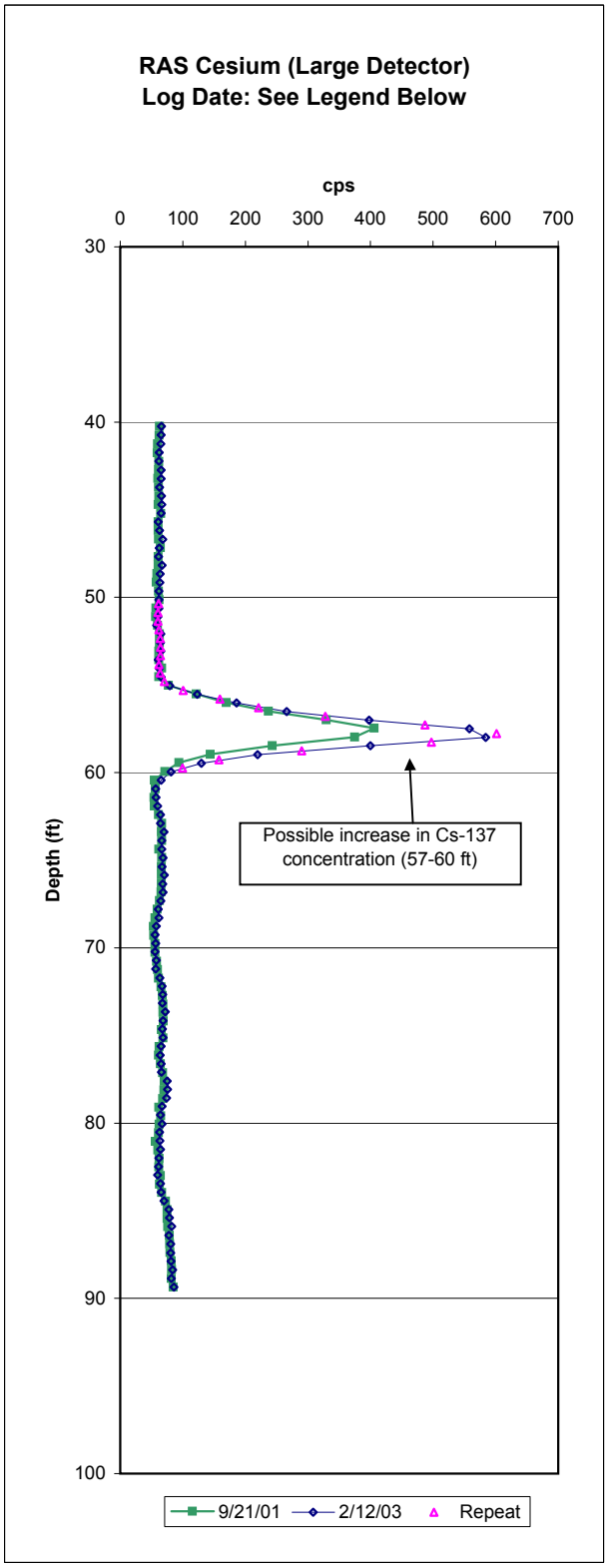
Type	Top (ft)	Bottom (ft)	ID (in.)	Thick (in.)	Stickup (ft)	Reference
Steel	0	125	8	0.313	0	Stoller

Log Run Information

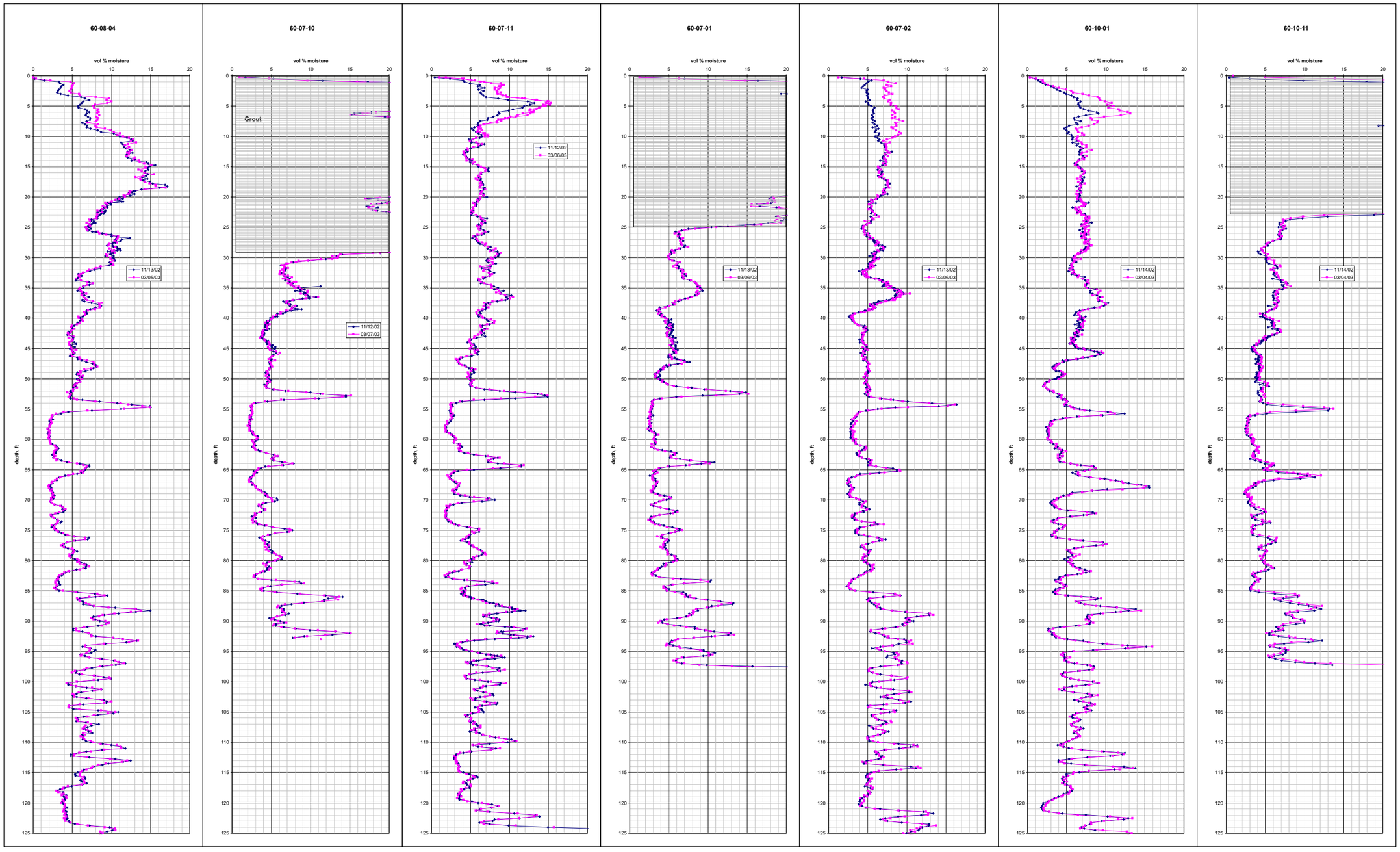
Log Date	System	Detector	Event	Log int. (ft)	Contractor	Comments
6/17/58	Nat. Gamma	Unk	n/a	0-116	PNL	On File at Sigma 5
6/25/1958	Nat. Gamma	Unk	n/a	0-125	PNL	On File at Sigma 5
12/12/1962	Nat. Gamma	Unk	n/a	0-125	PNL	On File at Sigma 5
11/5/1964	Nat. Gamma	Unk	n/a	0-125	PNL	On File at Sigma 5
10/13/1965	Nat. Gamma	Unk	n/a	0-125	PNL	On File at Sigma 5
7/11/1968	Nat. Gamma	Unk	n/a	0-125	PNL	On File at Sigma 5
7/15/1995	SGLS	G1A	n/a	0-124	RUST	Baseline
9/21/2001	RAS	Large	A	40-90	MACTEC-ERS	No Change
2/12/2003	RAS	Large-New	B	40-90	Stoller	Cs-137 increase (57-60 ft)

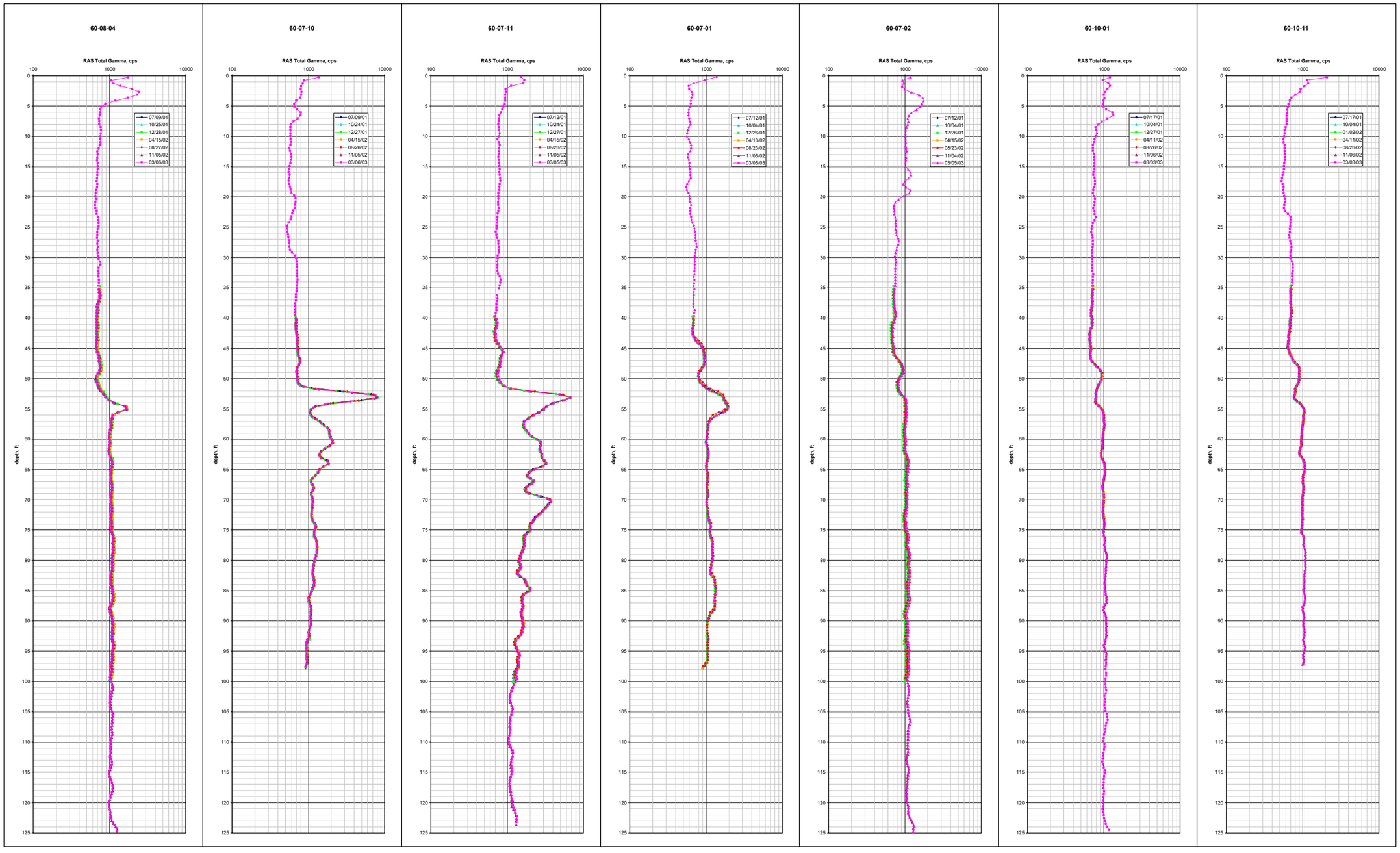
Borehole 41-15-07





Appendix C
Log Plots for U Farm
Moisture Logging


60-08-04
60-07-10
60-07-11
60-07-01
60-07-02
60-10-01
60-10-11
vol % moisture
depth, ft
Grout
11/13/02
03/05/03
11/12/02
03/07/03
11/12/02
03/06/03
11/13/02
03/06/03
11/13/02
03/06/03
11/14/02
03/04/03
11/14/02
03/04/03


60-08-04
RAS Total Gamma, cps
100
1000
10000
depth, ft
07/09/01
10/25/01
12/28/01
04/15/02
08/27/02
11/05/02
03/06/03
60-07-10
RAS Total Gamma, cps
depth, ft
07/09/01
10/24/01
12/27/01
04/15/02
08/26/02
11/05/02
03/06/03
60-07-11
RAS Total Gamma, cps
depth, ft
07/12/01
10/24/01
12/27/01
04/15/02
08/26/02
11/05/02
03/05/03
60-07-01
RAS Total Gamma, cps
depth, ft
07/12/01
10/04/01
12/26/01
04/10/02
08/23/02
11/05/02
03/05/03
60-07-02
RAS Total Gamma, cps
depth, ft
07/12/01
10/04/01
12/26/01
04/15/02
08/23/02
11/04/02
03/05/03
60-10-01
RAS Total Gamma, cps
depth, ft
07/17/01
10/04/01
12/27/01
04/11/02
08/26/02
11/06/02
03/03/03
60-10-11
RAS Total Gamma, cps
depth, ft
07/17/01
10/04/01
01/02/02
04/11/02
08/26/02
11/06/02
03/03/03

Appendix D
Boreholes Projected for Monitoring During the Third Quarter of FY 2003

Appendix D. Boreholes Projected for Monitoring During the 3rd Quarter of FY 2003

Borehole Number	Tank	Top	Bottom	Footage	Rerun Footage	Total Score	Next Log Date	HRLS	RAS Event A	RAS Event B	RAS Event C	RAS Event D	RAS Event E	RAS Event F	Ras Event G	Comment
10-01-01	A-101	45	85	40		89	06/16/03		06/27/01	06/21/02						No apparent change
10-01-03	A-101	45	78	33		89	06/16/03		06/27/01	06/21/02						No apparent change
10-01-04	A-101	35	85	50		114	06/16/03		06/27/01	06/21/02						No apparent change
10-01-16	A-101	20	52	32		114	06/12/03		06/19/01	06/17/02						No apparent change
10-01-28	A-101	20	43	23		114	06/13/03		06/19/01	06/18/02						No apparent change
10-01-39	A-101	20	44	24		114	06/13/03		06/20/01	06/18/02						No apparent change
10-05-02	A-105	45	119	74		115	06/13/03		06/25/01	06/18/02						No apparent change
10-05-05	A-105	45	74	29		115	06/15/03		06/25/01	06/20/02						No apparent change
10-05-07	A-105	45	75	30		115	06/15/03		06/26/01	06/20/02						No apparent change
10-05-08	A-105	45	55	10		115	06/15/03		06/26/01	06/20/02						No apparent change
10-05-09	A-105	45	77	32		115	06/26/03		06/26/01	07/01/02						No apparent change
10-05-10	A-105	25	100	75		140	06/15/03		06/26/01	06/20/02						No apparent change
10-05-12	A-105	45	75	30		115	06/15/03		06/26/01	06/20/02						No apparent change
11-01-02	AX-101	45	85	40		66	06/12/03		06/17/02							No apparent change
11-02-12	AX-102	20	50	30		27	06/09/03		06/14/02							No apparent change
11-03-02	AX-103	20	90	70		32	06/08/03		06/13/02							No apparent change
20-00-05	B-101	35	110	75		37	05/24/03		05/29/02							No apparent change
20-01-01	B-101	35	75	40		37	05/23/03		05/28/02							No apparent change
20-01-06	B-101	25	60	35		37	05/24/03		05/29/02							No apparent change
20-06-03	B-106	35	75	40		28	05/23/03		05/28/02							No apparent change
20-07-02	B-107	35	100	70		38	05/17/03		05/22/02							No apparent change
20-07-11	B-107	35	85	50		38	05/18/03		05/23/02							No apparent change; possible Sr-90 at 72 ft
20-10-02	B-110	20	98	78		37	05/25/03		05/30/02							No apparent change; possible Sr-90 at 75 ft
20-10-07	B-110	35	75	40		37	05/24/03		05/29/02							No apparent change
21-02-04	BX-102	0	230	0		94	06/22/03	06/27/02	09/04/01							No apparent change; HRLS 6/27/02
21-06-05	BX-106	25	75	55		26	03/20/03		03/25/02							No apparent change
21-07-06	BX-107	20	102	0		36	05/15/03	05/20/02	09/05/01							No apparent change
21-10-03	BX-110	0	100	0		42	05/16/03	05/21/02	08/30/01							No apparent change
21-11-03	BX-111	35	99	69		32	03/20/03		03/25/02							No apparent change
21-11-04	BX-111	35	75	45		32	03/16/03		03/21/02							No apparent change
22-00-02	BY-103	40	99	59		63	01/21/03		11/15/01	07/25/02						No apparent change
22-02-07	BY-102	170	260	90		31	03/30/00									Sampling equip. in well. Not logged 07-02.
22-03-04	BY-103	40	101	61		63	01/19/03		11/15/01	07/23/02						Possible change 77-82 ft not confirmed
22-06-05	BY-106	20	98	78		76	01/22/03		11/27/01	07/26/02						No apparent change
22-07-02	BY-107	30	100	70		68	01/25/03		11/29/01	07/29/02						Apparent change 98-100 ft not confirmed
22-07-05	BY-107	30	97	67		68	01/25/03		12/12/01	07/29/02						Apparent change 75-81 ft not confirmed
22-07-07	BY-107	40	99	59		68	02/16/03		12/12/01	08/20/02						No apparent change
22-08-02	BY-108	25	103	78		74	01/26/03		12/13/01	07/30/02						No apparent change
22-08-05	BY-108	35	98	63		74	05/19/03		12/17/01	07/30/02	11/20/02					Apparent change 75-82 ft not confirmed
22-08-12	BY-108	30	90	60		74	02/15/03		12/13/01	08/19/02						No apparent change
22-10-07	BY-110	40	80	40		53	01/14/03		12/11/01	07/18/02						No apparent change
30-00-01	C-106	0	67	67		34	04/16/03		04/24/02	01/16/03						No apparent change
30-01-06	C-101	30	70	40		43	04/13/03		04/18/02							No apparent change
30-01-09	C-101	20	70	55		43	04/20/03		04/25/02							No apparent change
30-03-01	C-103	30	125	95		51	04/12/98									Cannot log because of stairwell; 10/01 and 09/02
30-03-03	C-103	30	98	68		51	04/06/98									Water in borehole 10/01 - Cannot log

Appendix D. Boreholes Projected for Monitoring During the 3rd Quarter of FY 2003

30-03-09	C-103	30	98	68		51	04/14/03		04/19/02							No apparent change
30-04-08	C-104	30	70	40		9	03/23/02									BE - Cs-137
30-05-02	C-105	5	127	122		28	04/29/03		04/22/02	01/29/03						No apparent change
30-05-03	C-105	30	90	60		28	04/14/03		04/19/02							No apparent change
30-05-04	C-105	30	118	88		28	04/17/03		04/22/02							No apparent change
30-05-05	C-105	30	98	68		28	04/12/03		04/17/02							No apparent change
30-05-07	C-105	30	48	11		28	04/20/03		04/25/02							No apparent change; requires HRLS
30-05-08	C-105	30	49	19		28	04/17/03		04/22/02							No apparent change
30-06-02	C-106	0	122	122	10	9	04/27/03		01/27/03							No apparent change
30-06-03	C-106	0	98	98		9	04/23/03		01/23/03							No apparent change
30-06-04	C-106	0	129	129		34	04/27/03		09/11/02	01/27/03						No apparent change
30-06-09	C-106	5	98	93	10	47	04/22/03		04/22/02	01/22/03						No apparent change
30-06-10	C-106	0	129	129		59	04/23/03		04/23/02	01/23/03						Possible change 124-126 ft Co-60
30-06-12	C-106	0	99	99		47	04/24/03		04/24/02	01/24/03						No apparent change
30-07-01	C-107	30	70	40		9	02/09/02									BE - Cs-137
30-07-02	C-107	30	70	40		9	02/14/02									BE - Cs-137
30-07-05	C-107	30	70	40		9	02/21/02									BE - Cs-137
30-07-08	C-107	30	70	40		9	02/15/02									BE - Cs-137
30-08-02	C-108	30	99	69	10	27	04/21/03		09/11/02	09/12/02	01/21/03					Definite change in Co-60 49-75 ft
30-08-03	C-108	30	50	20		2	04/21/03		01/21/03							Possible increase 42-47 ft (Cs-137)
30-09-06	C-109	30	98	68		40	04/29/03		04/23/02	01/29/03						No apparent change
30-09-07	C-109	30	124	94	10	27	04/16/03		09/11/02	01/16/03						No apparent change
30-11-01	C-111	30	70	40		7	02/02/02									BE - Cs-137
30-11-05	C-111	30	70	40		7	02/06/02									BE - Cs-137
30-11-11	C-111	30	70	40		7	02/12/02									
40-02-03	S-102	20	80	0		39	04/20/03	04/25/02								HRLS 04/25/02; no apparent change
40-04-05	S-104	35	100	82		52	06/06/03	04/24/02	06/11/02							No apparent change
40-04-07	S-104	35	80	45		52	05/26/03		05/31/02							No apparent change
40-04-08	S-104	20	50	30		52	05/19/97									Borehole obstruction
40-07-01	S-107	35	80	45		48	05/26/03		05/31/02							No apparent change
40-07-08	S-107	40	80	40		23	05/24/97									
40-07-10	S-107	40	80	40		23	05/02/01									
40-11-09	S-111	40	80	40		39	05/31/03		06/05/02							No apparent change
41-07-05	SX-107	40	75	0		44	04/14/03	04/19/02	09/25/01							No apparent change; HRLS 04/19/02
41-07-08	SX-107	40	76	46		56	03/16/02		09/17/01							Vent pipe obstruction FY 02
41-08-07	SX-108	40	65	0		52	04/13/03	04/18/02	09/25/01							No apparent change; HRLS 04/18/02
41-08-11	SX-108	40	75	0		40	04/13/03	04/18/02	09/26/01							No apparent change; HRLS 04/18/02
41-09-03	SX-109	40	74	0		46	04/17/03	04/22/02	09/26/01							No apparent change; HRLS 04/22/02
41-09-04	SX-109	40	102	62		58	03/08/00									Not logged due to bh contamination
41-12-02	SX-112	40	122	0		63	04/18/03	04/23/02	10/03/01							No apparent change; HRLS 04/23/02
50-00-09	T-106	30	120	90		142	02/24/03		07/18/01	01/09/02	08/28/02					No apparent change
50-01-09	T-101	30	90	60		61	02/24/03		07/30/01	11/08/01	01/22/02	08/28/02				Apparent change at 86-90 ft not confirmed
50-02-05	T-102	30	85	55		55	02/24/03		07/25/01	01/22/02	08/28/02					No apparent change
50-03-06	T-103	30	120	90		28	03/20/99									Water in BH 01/02 - not logged
50-04-08	T-104	30	96	66		55	02/24/03		07/31/01	01/24/02	08/28/02					No apparent change
50-04-10	T-104	35	88	53		55	03/16/03		07/31/01	01/22/02	08/29/02	12/16/02				Apparent change 67-68 ft, ongoing 12/16/02
50-05-06	T-105	30	90	60		27	04/17/99									Water in BH 01/02- not logged
50-05-07	T-105	30	87	57		27	01/03/03		01/08/02							No apparent change
50-06-02	T-106	30	122	92		142	02/25/03		07/19/01	11/07/01	01/15/02	08/29/02				Apparent change at 110 ft not confirmed
50-06-03	T-106	30	118	88		142	02/24/03		07/18/01	11/12/01	01/15/02	08/28/02				Apparent change at 115 ft not confirmed
50-06-18	T-106	25	130	95		142	03/31/03		08/01/01	01/29/02	09/03/02	12/31/02				Possible increase 117-119 ft (Co-60), poss. ongoing 12/31/02
50-07-07	T-107	30	70	40		42	04/07/00									No log - water filled (06/18/01)
50-08-07	T-108	30	119	89		27	01/05/03		01/10/02							No apparent change
50-08-08	T-108	30	95	65		27	01/03/03		01/08/02							No apparent change

Appendix D. Boreholes Projected for Monitoring During the 3rd Quarter of FY 2003

50-08-11	T-108	30	120	90		27	05/13/99									Water in BH 01/02- not logged
50-08-19	T-108	30	86	56		27	01/03/03		01/08/02							No apparent change
50-09-01	T-109	30	86	56		54	02/23/03		07/23/01	11/08/01	01/28/02	08/27/02				Apparent change at 85 ft result of water level
50-09-02	T-109	30	86	56		54	02/23/03		01/08/02	08/27/02						Apparent change 81-86 ft caused by different water levels
50-09-10	T-109	30	120	90		54	02/24/03		07/23/01	11/07/01	01/16/02	08/28/02				Apparent change at 76 and 94 ft not confirmed
51-01-02	TX-101	40	80	40		40	05/08/03		05/13/02							No apparent change
51-01-09	TX-101	40	80	40		27	12/21/96									Borehole cannot be located
51-03-01	TX-103	40	80	40		30	05/08/03		05/13/02							No apparent change
51-03-12	TX-103	40	100	60		30	05/09/03		05/14/02							No apparent change
51-04-02	TX-104	40	80	40		41	05/12/03		05/17/02							No apparent change
51-04-06	TX-104	40	80	40		41	05/11/03		05/16/02							No apparent change
51-05-01	TX-105	40	80	40		39	05/10/03		05/15/02							No apparent change
51-05-03	TX-105	25	80	55		51	05/08/03		05/13/02							No apparent change
51-07-07	TX-107	40	85	55		29	05/15/03		05/20/02							No apparent change
51-07-18	TX-107	40	80	40		29	05/11/03		05/16/02							No apparent change
52-03-03	TY-103	40	80	61		31	05/09/03	05/13/02	05/14/02							No apparent change; HRLS 05/13/02
52-03-06	TY-103	40	100	60		56	03/04/03		05/02/02	05/21/02	08/22/02	12/04/02				Definite change 55-60 ft; report issued 5/14/02
52-03-12	TY-103	40	100	60		31	04/27/03		05/02/02							No apparent change
52-05-07	TY-105	40	96	56		82	06/02/03		05/02/02	12/04/02						No apparent change
52-06-04	TY-106	40	80	40		54	05/02/03		05/07/02							No apparent change
52-06-05	TY-106	40	147	107		66	03/04/03		05/08/02	12/04/02						Possible change 130-148 ft, ongoing 12/04/03
52-06-06	TY-106	40	100	60		54	05/02/03		05/07/02							No apparent change
52-06-07	TY-106	200	238	38		41	05/02/03		05/07/02							No apparent change; Co-60 may be in GW
60-04-08	U-104	40	118	78		94	05/27/03		07/16/01	10/22/01	01/03/02	04/10/02	08/27/02	11/14/02	02/26/03	Apparent change (74-78 and 84-89 ft) not confirmed
60-05-04	U-105	35	72	37		44	06/01/03		07/16/01	10/24/01	08/27/02	11/14/02	03/03/03			No apparent change
60-05-05	U-105	35	123	88		44	05/27/03		07/16/01	08/27/02	11/13/02	02/26/03				Possible increase 75-80 ft
60-07-01	U-107	0	98	98		85	06/03/03		07/12/01	10/04/01	12/26/01	04/10/02	08/23/02	11/05/02	03/05/03	Apparent change 83-88 ft not confirmed
60-07-02	U-107	0	125	125		53	06/03/03		07/12/01	10/04/01	12/26/01	04/15/02	08/23/02	11/04/02	03/05/03	Apparent decrease 90-100 ft not confirmed
60-07-10	U-107	0	98	98		85	06/04/03		07/09/01	10/24/01	12/27/01	04/15/02	08/26/02	11/05/02	03/06/03	Apparent change (SGLS); 53-65 ft not confirmed
60-07-11	U-107	0	124	124		85	06/03/03		07/12/01	10/24/01	12/27/01	04/15/02	08/26/02	11/05/02	03/05/03	Apparent change (SGLS); 73-95 ft not confirmed
60-08-04	U-108	0	127	127		56	06/04/03		07/09/01	10/25/01	12/28/01	04/15/02	08/27/02	11/05/02	03/06/03	No apparent change
60-10-01	U-110	0	125	125		10	06/01/03		07/17/01	10/04/01	12/27/01	04/11/02	08/26/02	11/06/02	03/03/03	No apparent change
60-10-11	U-110	0	98	98	10	10	06/01/03		07/17/01	10/04/01	01/02/02	04/11/02	08/26/02	11/06/02	03/03/03	No apparent change